Services and Aftermarket

Environmental

Environmental Laboratories

Our environmental services provide definitive support on managing ecological impacts and meeting ever-evolving regulations on issues including chemical use and fluids discharge.

We are one of the world's leading laboratories offering ecotoxicology and environmental services of the highest quality. Working to the standards of Good Laboratory Practice (GLP) and ISO 9001 accreditation, our clients gain added value from considerable experience with chemical testing and guidance through the regulatory process. With our active membership of European Oilfield Speciality Chemicals Assocation (EOSCA) we also keep at the forefront of regulatory and industry developments.

From our laboratories in Orkney, Scotland, our highly skilled team of scientists and consultants offer reliable and independent ecotoxicology and environmental services. Our experience in cultivating marine and freshwater organisms, together with our large-scale water treatment systems, ensure consistent supply of species. This self-sufficiency allows us to be flexible in meeting your needs.

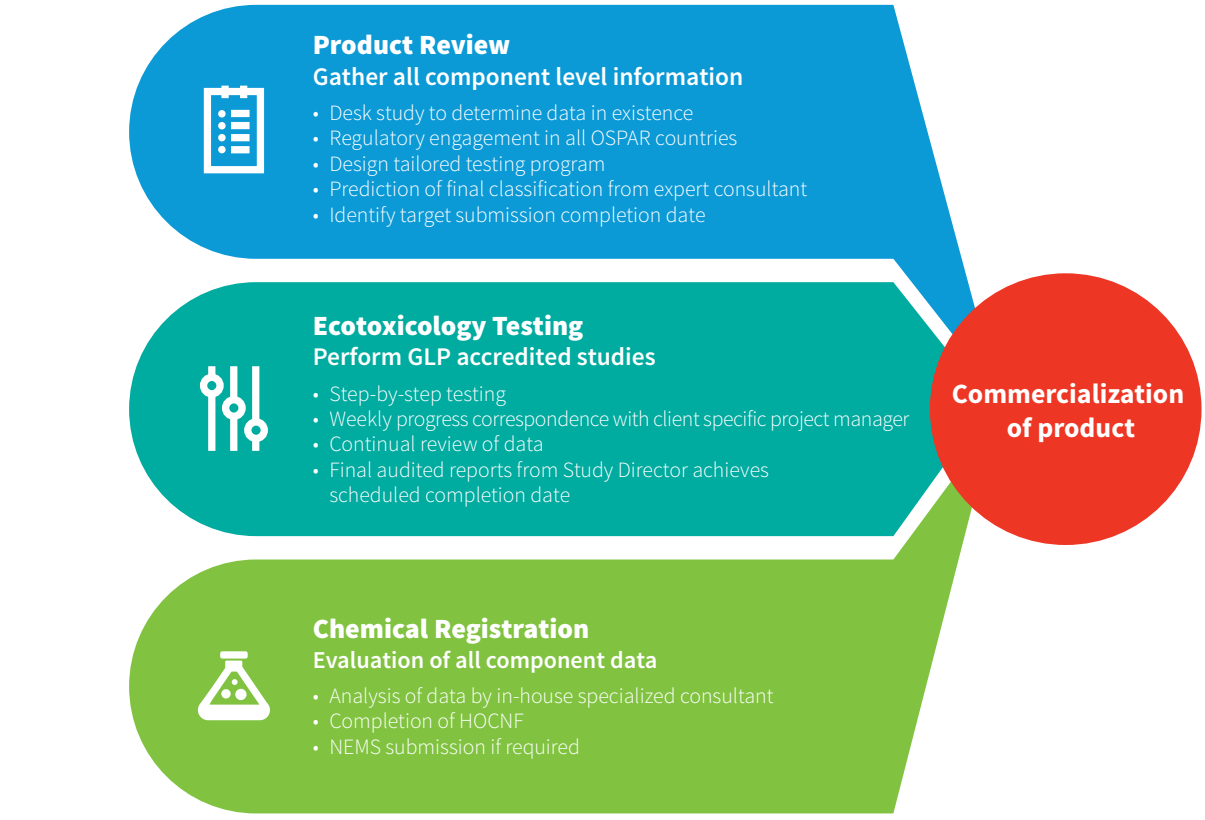
Determining environmental risk and understanding the regulatory implications of waste water discharge can be costly and challenging. Our environmental services help overcome these challenges through risk assessment of discharges, environmental modelling, ecotoxicology testing for chemical registration, and diverse consulting services related to environmental compliance.

To meet increasing regulatory requirements, we work in partnership with chemical companies, offering a wealth of standardized ecotoxicology tests which explore the effects of chemicals on marine, freshwater, and sediment-dwelling organisms, in-line with OSPAR (Oslo and Paris Conventions) recommendations. We offer a comprehensive range of marine and freshwater acute and chronic toxicity tests, bioaccumulation and biodegradation studies, which assess environmental risk of chemicals and waste water discharges. A stage-wise testing plan in order to monitor a chemical's performance against the OSPAR pre-screening scheme is also advantageous.

Our expertize in Harmonised Mandatory Control System (HMCS) can support and guide our customers through all aspects of Harmonised Offshore Chemical Notification Format (HOCNF) registration and Chemical Hazard Assessment and Risk Management (CHARM) assessments to authorize chemical use offshore.

For companies seeking assistance with HOCNF completion, we make the process effortless by working with the regulators on your behalf. Our global awareness allows us to offer consultancy to businesses seeking expansion into other regions, as well as those unfamiliar with the intricacies of local directives.

We offer complete guidance consultation packages, from pre-test review of chemical component data to completion and submission of chemical registration documentation.



Replace testing
By removal of substances that would fail OSPAR pre-screening

Reduce testing
By reviewing results at each stage to eliminate unncessary studies

Refine data
By efficient collation and submission minimizing time involved

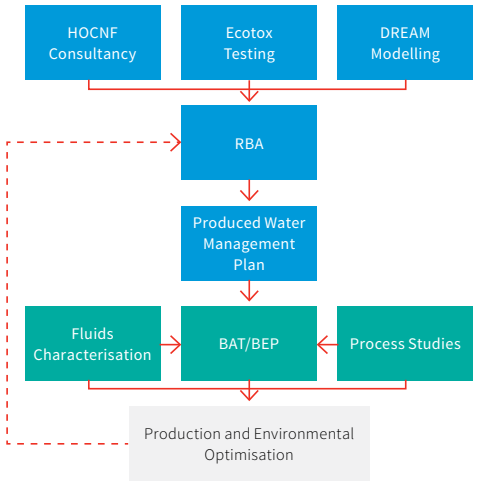
Environmental Impact

Impact

Using the DREAM (Dose related Risk and Effect Assessment Model) programme, scientists can mimic site specific conditions, including weather and tidal data, to characterize the environmental risk of offshore discharges.

Environmental Modelling

- Dispersion to determine an Environmental Impact Factor (EIF)
- EIF >1 indicates potential environmental risk
- Extensively used in UK and Norway for the Risk Based Approach (RBA), management of produced water discharges
- Identification of substances which contribute the greatest potential risk
- Allows the benefits of any mitigating measures to be pre-quantified



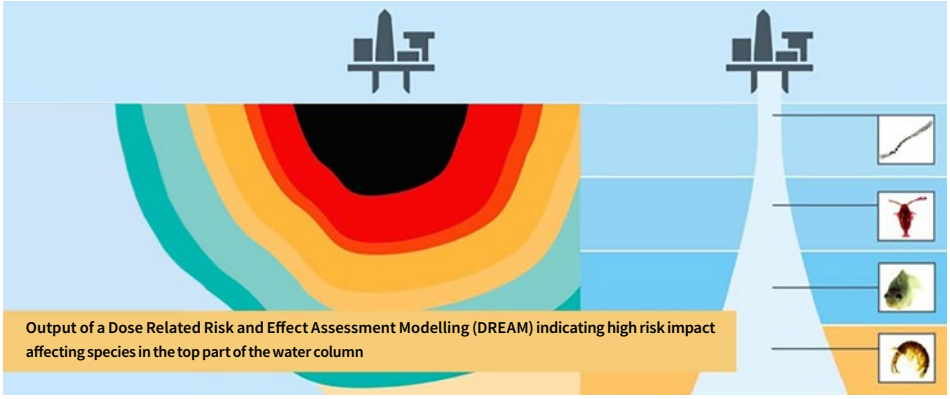
Applications

- Produced water discharges
- Drill cuttings and mud discharges
- MEG discharges
- Discharges to sea from land terminals
- Decommissioning sludge and other residues
- Any waste water discharges

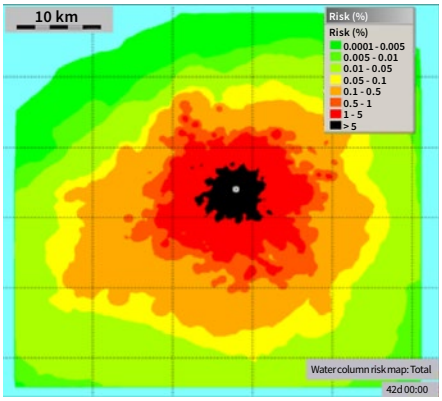
Process performance feedback loop

- Area of poor performance
- Identified areas for improvement
- Future developemnt plans

We deliver specialized process engineering knowledge and environmental understanding to provide a comprehensive service and maximum budget return.



Output of a Dose Related Risk and Effect Assessment Modelling (DREAM) indicating high risk impact affecting species in the top part of the water column



Toxicity

We supply a full range of aquatic toxicity studies for the completion of HOCNF submissions according to HMCS requirements. Measured analysis of test concentrations with High Performance Liquid Chromatography (HPLC) is possible for pure substances. Our studies are performed in accordance with GLP accreditation and to OSPAR/ OECD, ISO, and ASTM (USA) guidelines.

Bioaccumulation

Chemicals are commonly screened for their bioaccumulation potential using HPLC following OECD Guideline 117. This test measures the octanol-water partition coefficient (Log P_{ow}); and estimates a chemical's ability to move from the aqueous phase (environment) into the lipid phase and across the cell membrane of an organism and accumulate within its body.

Biodegradation

Biodegradation testing determines the extent to which a chemical will naturally break down in the environment.

Using our abundant supply of natural seawater alongside our dedicated temperature control facilities ensures that we have a plentiful supply of resources for testing.

We understand the requirements for chemical registration and offer flexible testing services of specific chemicals, its properties, and results obtained.

Marine Ecotoxicology Services

Marine Test	Method
Algae $EC(r)_{50}$ 72 hr screening toxicity test with *Skeletonema costatum*	ISO 10253
Algae $EC(r)_{50}$ 72 hr acute toxicity test with *Skeletonema costatum*	ISO 10253
Copepod LC_{50} 48 hr screening toxicity test with *Acartia tonsa*	ISO 14669
Copepod LC_{50} 48 hr acute toxicity test with *Acartia tonsa*	ISO 14669
Calanoid copepod early development chronic test with *Acartia tonsa*	ISO 16778
Fish 96 hr acute toxicity limit test with *Cyprinodon variegatus*	OSPAR, Part B
Fish LC_{50} 96 hr acute toxicity definitive test with *Cyprinodon variegatus*	OSPAR, Part B
Fish early–life stage toxicity chronic test with *Cyprinodon variegatus*	OECD 210
Fish, short-term toxicity chronic test on embryo and sac-fry stages with *Cyprinodon variegatus*	OECD 212
Sediment re-worker LC_{50} 10-day acute toxicity test with *Corophium volutator*	OSPAR, Part A
Marine 28-day / 63-day biodegradation test	OCED 306 closed bottle
Marine BODIS 28-day / 63-day biodegradation test	Modified ISO 10708 test for the Marine Environment
COD analysis	Potassium dichromate reactor digestion method
TOC analysis	Oxidative combustion-infrared analysis
Bioaccumulation HPLC Log P_{ow} test	OECD 117
Bioaccumulation theoretical Log P_{ow} test	EPI Suite™

Toxicity

We offer a range of ecotoxicity studies using freshwater species under the internationally recognized OECD standards, which are approved by the majority of regulatory bodies worldwide.

Bioaccumulation

Freshwater bioaccumulation requires the same OECD 117 screening study required for marine ecotoxicology. We can offer comprehensive support in all areas of testing and regulatory requirements.

Biodegradation

There are numerous freshwater biodegradation studies, and choosing the most suitable can be complicated. Our knowledgeable staff offers guidance on each test type to ensure the appropriate method is used.

Chemistry

From our chemistry support laboratory, experienced chemists use recognized methods and instrumentation to provide measured analysis of test concentrations.

Freshwater Ecotoxicology Services

REACH Annex VII ecotoxicology testing	Method
Algae $EC(r)_{50}$ 72 hr screening toxicity test with *Pseudokirchneriella subcapitata*	OECD 201
Algae $EC(r)_{50}$ 72 hr acute toxicity test with *Pseudokirchneriella subcapitata*	OECD 201
Crustacean LC_{50} 48 hr screening toxicity test with *Daphnia magna*	OECD 202
Crustacean LC_{50} 48hr acute toxicity test with *Daphnia magna*	OECD 202
REACH Annex VII biodegradation and bioaccumulation testing	**Method**
Freshwater 28-day / 63-day closed bottle biodegradation test	OECD 301D
Freshwater 28-day CO_2 evolution test	OECD 301B
COD analysis	Potassium dichromate reactor digestion method
TOC analysis	Oxidative combustion-infrared analysis
Bioaccumulation HPLC Log P_{ow} test	OECD 117
Bioaccumulation theoretical Log P_{ow} test	EPI Suite™
REACH Annex VIII ecotoxicology testing	**Method**
Fish LC_{50} 96 hr acute toxicity definitive test with *Danio rerio*	OECD 203
REACH Annex IX chronic ecotoxicology testing	**Method**
Crustacean EC_{50} & NOEC 21-day growth & reproduction chronic test with *Daphnia magna*	OECD 211
Fish early-life stage toxicity chronic test with *Danio rerio*	OECD 210
Fish, short-term toxicity chronic test on embryo and sac-fry stages with *Danio rerio*	OECD 212

CHARM

With years of experience ranking chemicals according to the CHARM model, we provide the testing, model the impact, and complete the registration process on your behalf.

HOCNF Completion

HOCNF is used by all OSPAR countries and with our understanding of the unique requirements of the UK, Norwegian, Dutch, and Danish regulatory authorities we can guide our clients through the many complexities involved.

Training Services

We provide training services for clients wishing to know more about chemical regulations, ecotoxicology, HOCNF completion, and CHARM calculations. Our membership of the European Offshore Specialist Chemicals Association (EOSCA) ensures we stay up to date with the latest North Sea chemical regulations. This then feeds into our training services which are tailored to our clients' specific requirements.

We contribute specialized process engineering knowledge and environmental understanding to provide a comprehensive service and maximum budget return.

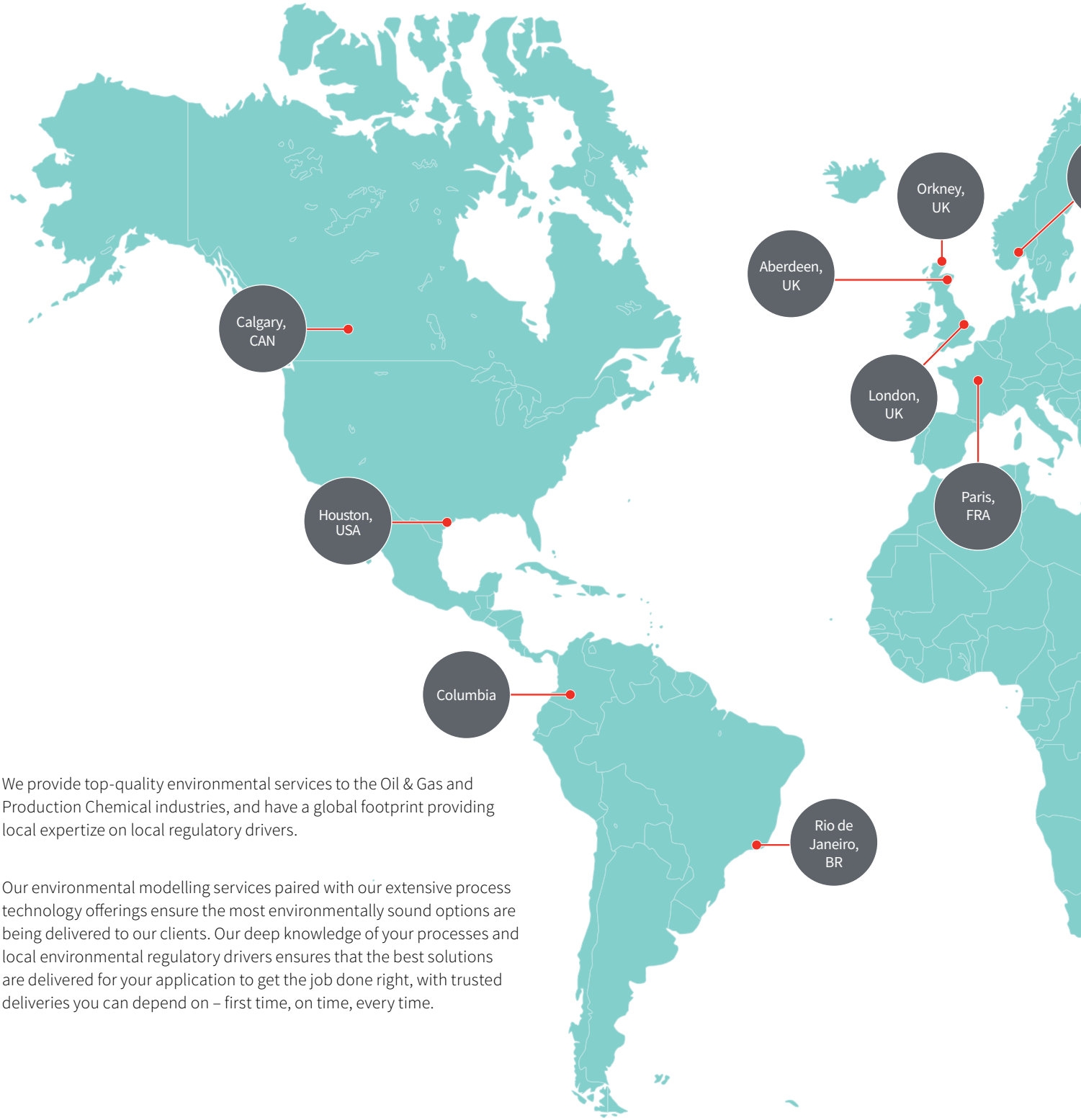
REACH

We provide companies with testing strategies for a number of regulatory regimes including REACH. Our thorough knowledge of the test protocols enables us to provide data that meets the stringent requirements of the regulators.

Other Directives

Our wide-ranging knowledge of environmental legislation, also including the biocidal products regulation and ecolabel, means we are well placed to advise companies on the applicable directives necessary for the approval of chemical products.

Process and Flow Technologies



We provide top-quality environmental services to the Oil & Gas and Production Chemical industries, and have a global footprint providing local expertize on local regulatory drivers.

Our environmental modelling services paired with our extensive process technology offerings ensure the most environmentally sound options are being delivered to our clients. Our deep knowledge of your processes and local environmental regulatory drivers ensures that the best solutions are delivered for your application to get the job done right, with trusted deliveries you can depend on – first time, on time, every time.

Service Locations

Corporate Headquarters
10353 Richmond Ave.
Houston, Texas 77042
USA

Process and Flow Technolgies
Flotta
Stromness, Orkney KW16 3NP
United Kingdom